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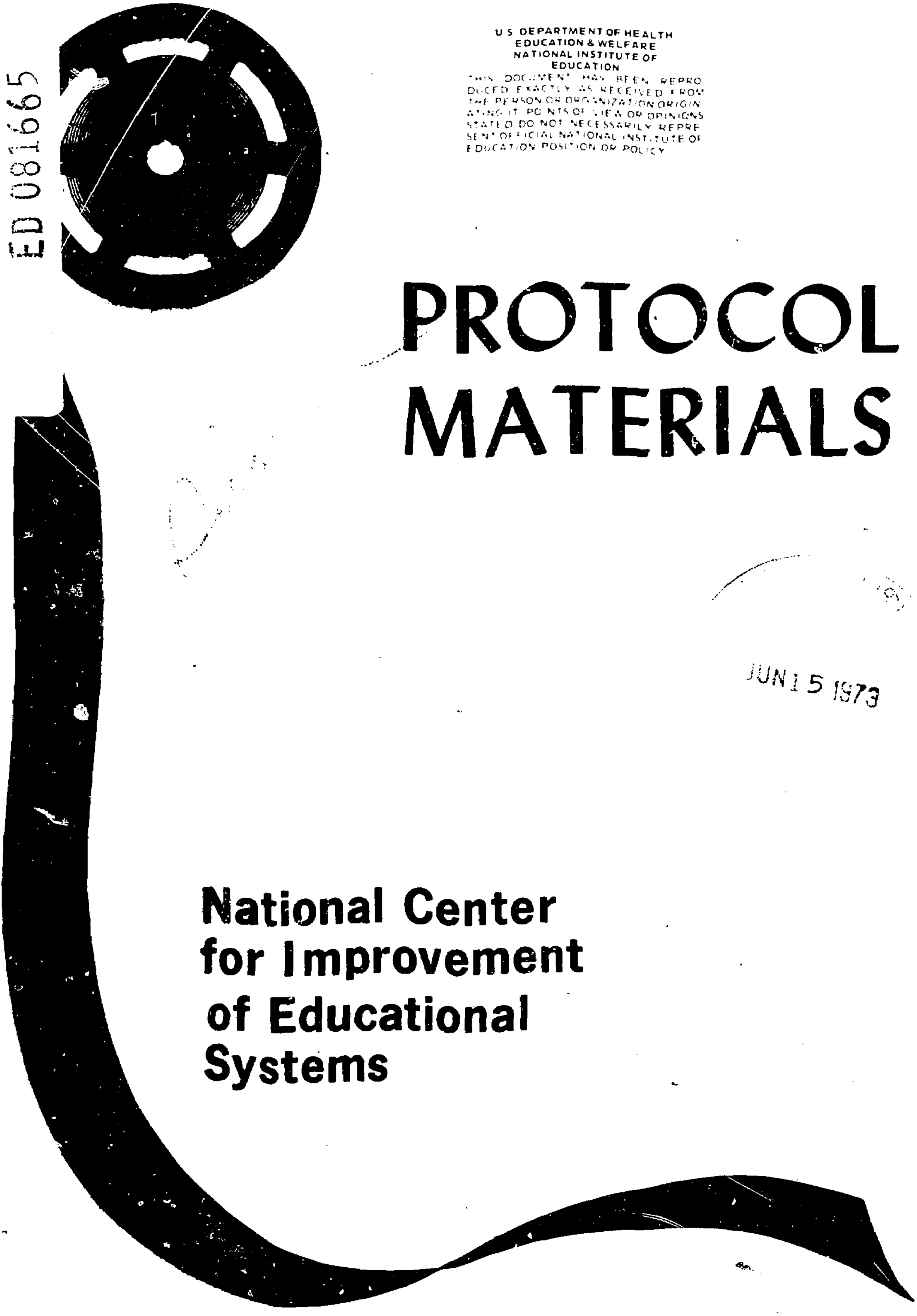
ABSTRACT

Recognizing the demand for teaching concepts in teacher education programs, the Bureau of Educational Personnel Development in 1970 initiated an effort to train educational personnel to develop and use protocol materials--instructional materials, usually employing audio tape, video tape, or film, intended to illuminate a concept by showing instances to which the concept correctly applies. These instances typically involve the behaviors of children and adults as they appear in the classroom or in other community settings in which teachers might be expected to interpret behavior for purposes of education. Description is given of this protocol materials effort which is essentially a training program for project directors. The materials being produced, primarily films, cover the following subject matter areas: educational psychology, reading, literature, language acquisition, Black English, social psychology, teaching analysis, and social studies. Appendices list the eleven pilot projects which were funded initially and described a progressive evaluation system, developed by Richard L. Turner, which currently is used in training project directors as they develop protocol materials. (Author/SHM)



PROTOCOL MATERIALS

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**National Center
for Improvement
of Educational
Systems**

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PROTOCOL MATERIALS

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National Center for the Improvement of
Educational Systems
U. S. Office of Education
William L. Smith, Associate Commissioner

PROTOCOL MATERIALS

The impetus for the kind of educational change that truly improves the classroom setting must either be initiated by or closely involve teachers. All too often theories concerned with educational change have resulted in innovation which exists seemingly only for its own sake. Frequently the educational theorist is the university professor, who, long away from the classroom, suggests change based upon the soundest of theory and the most impractical of method. In the classroom the effort leads at best to more theorizing and at worst to disaster.

It seems apparent that worthwhile and lasting change can occur only through the joint efforts of university staffs, administrators, supervisors, and classroom teachers. Preparing individuals for the dual role of competent teaching and educational planning is the responsibility of the teacher education program, for the final test of the validity of educational planning is what happens in the classroom. That teachers acquire knowledge and skill on the job is patently clear; however, they should enter the classroom already equipped with certain understandings and skills.

Universities and school systems, the institutions that train educational personnel recognize the need for materials that will help supervisors and teachers acquire these understandings and skills. Although innumerable written materials exist in education and allied fields, few appear to induce desired behaviors in pre- or in-service teachers.

Traditionally, the teacher's primary function at any level has been to help students learn. If teachers are to help students learn, however, they must be prepared for the task of teaching; they must know the subject matter, and they must know how to teach. Additionally, the teacher must not only understand the students but he also must understand the learning process. Individuals differ in learning rates and respond to teaching-learning situations in various ways.

Developing understandings about learning is not an easy task. Extensive observation of students is essential, yet observation without focus accomplishes little. The observations must be directed; the teacher must look for particular kinds of behaviors. There is no guarantee that a given stimulus will result in the behavior the teacher wishes to observe; he may observe a class for an entire school day and find no evidence of a desired behavior. Even if a particular behavior is exhibited, the instance may be fleeting and the observer has only his recollection for considered study.

Preparation for interpreting behavior usually consists of courses presented in the traditional reading-lecture-discussion manner which often fail to achieve their goals because the instruction is divorced from reality. Concepts and principles frequently are taught in abstraction with little opportunity provided the teacher for applying them in meaningful situations. One means of bridging the gap between theory and reality is reproducing a variety of behaviors of students, teachers, and others in a permanent recallable form. A particular segment of behavior can be reproduced again and again to be studied, analyzed, and the concepts appropriate to its interpretation spotlighted, explained, learned, and reviewed. The concepts can then be applied to the understanding of other behaviors. Instructional materials of this type are referred to as protocol materials.

Protocol materials constitute one of two general categories of instructional materials for teachers--one: the materials that direct the pre- or in-service teacher in studying his and others' behavior, and two: those materials that guide him in systematic practice of the skills he must acquire. Materials that enable the teacher to study behavior are referred to as protocol materials. Training materials, on the other hand, are designed to help the teacher in the acquisition of skills and provide for (1) identification of skills, (2) description of behavior entailed by the skills, (3) performance of the behavior, and (4) feedback to the performer and further performance by him.

Cognitions, however, are developed primarily through the use of protocol materials which provide for (1) segments of behavior categorized for the purpose of teaching concepts and principles used in interpreting behavior as well as the social context in which the teacher works, (2) segments of behavior categorized for the purpose of teaching knowledge about knowledge, and (3) segments of behavior categorized for the purpose of teaching self-understanding. According to Smith, the study of protocol materials not only results in the teacher's ability to understand or interpret situations he faces in the classroom, school, and community, but it also increases his interest in theory as he discovers that it is useful in teaching.[5]

Hudgins considers a protocol the portrayal of a concept which is pertinent to the subject matter with which the teacher deals or a concept about teaching itself. He notes that the portrayal of a concept is not merely a dictionary definition of the label given to the concept; rather, it involves laying out, through a series of episodes, the characteristics that exemplify the concept to be portrayed.[4]

Protocol materials consist of reproductions of behavior--visual audio-visual, or printed media--that exemplify concepts relevant to teaching and learning. The use of protocol materials may enable teachers to acquire concepts that have not been learned particularly well when presented in the traditional manner--through lectures, discussion, or readings. Although the occasional brilliant teacher may present concepts so skillfully that they are acquired by prospective or practicing teachers, more often the result is exposure to concepts with no assurance that concept acquisition has occurred.

Gliessman says that if teachers are to develop the ability to use concepts interpretively, verbal instruction alone is almost certainly insufficient. Teachers should have an opportunity to observe and interpret on-going behavior using concepts in a systematic way; protocol materials provide behavior that can be interpreted.[3] According to Smith, if a teacher does not understand the nature of concepts, causes, and values, he does not know the subject matter of instruction and consequently lacks the logical, psychological, and linguistic sophistication that will enable him to manipulate content to the advantage of the pupil.[5]

Protocol materials should bridge the gap between theory and the teaching-learning situation. Since they provide reproductions of behavior, they foster the teacher's interpretive and diagnostic competency. Gee and Berliner say that protocol materials serve a dual role: first, they teach concepts, and second, they teach teachers how to interpret and diagnose human behavior in terms of those concepts. They further divide the diagnostic component of protocol materials into three stages: (1) a functional knowledge of some psychological, philosophical, sociological,, etc., concepts that are relevant to the teacher's work; (2) the ability to interpret behavioral situations in terms of these concepts, and (3) the ability to use such interpretations to formulate alternative plans for teaching and other pertinent activities in which the teacher is engaged. The study of protocol materials should aid teachers in mastering concepts which can serve as the basis for interpretation of behavior and for decision making. The prospective or practicing teacher can become familiar with a variety of instances of the concepts to be taught. The materials provide an opportunity for the teacher to understand the defining properties of the concept and to identify, at an indicated level of competence, instances of the concept that are relevant to the educational setting.[2]

A concept may lead directly into a skill, or it may bear no relationship to a skill. The concept of diagnosis, once acquired by teachers,can, with appropriate training, lead to the skill of diagnosis--a skill which a teacher uses daily in the classroom in determining each student's progress in learning. Conversely, concepts such as respect or racism do not lend themselves to parallel skills.

A basic problem is precision in defining a concept; a concept must be defined precisely and its attributes specified in terms which permit no misunderstanding. Carroll notes that meaning and concept generally have been treated as separate things by different disciplines. Meaning has been considered to belong to semantics while "concept is almost anybody's oyster." Concepts, according to Carroll, are properties of organismic experience, the "abstracted and often cognitively structured classes of mental experience learned by organisms in the course of their life histories." There are necessary conditions for the formation of a concept: the individual must have a series of experiences that are similar in one or more respects; the constellation of respects in which they are similar constitutes the underlying concept. Positive instances of the concept are experiences embodying the concept, and negative instances are those which do not. Another essential condition for concept formation is that the series of experiences embodying the concept must be preceded, interspersed, or followed by other experiences that constitute negative instances of the concept. As the complexity of the concepts increases, the necessity for an appropriate sequencing of positive and negative instances to assure adequate learning of the concept becomes greater.

Concepts become more complex during the course of an individual's life. Because each individual's experiences are unique to him, he will classify these experiences in particular ways. Consequently, the critical attributes that differentiate experiences can be specified. The individual does not necessarily have to specify the attributes; for example, children may not be able to verbalize the similarities in experiences, but consistent responses to particular stimuli indicate that concept information has occurred. Carroll mentions the classic instance where the child is afraid of the barber because he wields instruments, scissors, that look like those of the doctor whom he has already learned to fear, and because he wears a similar white smock.[1]

Recognizing the demand for materials for teaching concepts in teacher education programs, the Bureau of Educational Personnel Development in 1970 initiated an effort to train educational personnel to develop and use protocol materials. Materials developed for training teachers generally have been prepared in isolation with no field testing during the development stages.

Since protocol materials should be attuned to problems teachers encounter, the Office of Education insisted that people should be trained to develop protocol materials with field testing and modification based on the field testing an integral part of the training program. Eleven pilot projects were funded initially,[*] currently 16 projects are being supported.

The protocol materials effort is essentially a training program. Project directors are trained, under the aegis of the Leadership Training Institute on Protocol and Training Materials, to develop and use protocol materials. The Leadership Training Institute is composed of a group of consultants outside the Office of Education headed by B. Othanel Smith of the University of South Florida who are responsible for providing technical assistance to the project directors. The training involves several stages. The concepts to be exemplified in protocol materials must be selected and analyzed. The concepts must be critical to teacher education; that is, they must be concepts that teachers need to know. A paramount consideration is utility; the concepts to be portrayed in the materials must contain an element of universality so that the materials will be useful at any institution or agency which

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[*] The eleven pilot projects are listed in Appendix A.

trains or retrain teachers. A developer can substantiate empirically that the concepts he chooses to exemplify meet selection criteria. If the final products are to be films or tapes, a director must learn to work with producers.

The materials being produced, primarily films, cover the following subject matter areas: educational psychology, reading, literature, language acquisition, Black English, social psychology, teaching analysis, and social studies.

However, the products of these efforts, important as they may be in themselves, are not the major part of this OE effort. The important result to the future of teacher training lies in the fact that these leaders in the field of teacher education will themselves have acquired skill in the development of protocol materials.

A major contribution to the protocol materials program is a progressive evaluation system developed by Richard L. Turner* which currently is used in training project directors as they develop protocol materials. It should become a highly useful tool in the future development of materials for teacher education.

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*The Progressive Evaluation of Protocol Materials Development appears in Appendix B.

The system is based on five frames incorporating nine evaluation decision points. The project director answers criterial questions, providing evidence for the questions at each decision point. If sufficient evidence for each question cannot be given by the project director, or, in some cases, the producer or evaluator, the director must return to the first frame and select another concept which can be carried through the progressive evaluation.

The first frame concerns the concept selected for exemplification. The concept must be named, and the criteria for the concept listed as well as an instance of the application of the concept in a given situation. The director should be able to sketch three situations in which the concept could be observed in someone's behavior. If the final product is a film or video tape, the producer also suggests three situations in which the concept could be observed. If the concept lacks clarity and cannot be represented, the director either reconsiders the evidence or he returns to the beginning of Frame One. If the evidence provided by both the project director and producer indicates that the concept can be represented, Evaluation Decision #1 is reached, and the director proceeds to Frame Two, the significance of the concept.

PROGRESSIVE EVALUATION OF

PROTOCOL DEVELOPMENT

Evaluation Decision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 1: The Concept	Start		
	What is the label (name) for the concept?	The label is ______	Project Director
	What are the criteria-in-mind- for the concept? How would I know when to apply this concept in a situation?	The criteria-in-mind are: (tell or show) 1. ______ 2. ______ 3. ______ n. ______	Project Director
	Can I sketch three situations in which the concept would be observed in (or induced from) someone's behavior?	The sketches are (1 paragraph each) 1. ______ 2. ______ 3. ______	Project Director gives three. Producer gives different three.
Evaluation Decision #1 1. The concept probably can be represented; move ahead. 2. Concept not clear: reconsider evidence or return to start.			

Evaluation Decision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 2: The significance of the concept	How important is this concept? Can I name three texts in which the concept appears?	The texts and page references are: 1. ______ ______ 2. ______ ______ 3. ______ ______	Project Director and associates
	What empirical evidence is there to support the importance of the concept to teaching?	The following scholarly papers investigated the concept: 1. ____________ 2. ____________ 3. ____________	Project Director and associates
	Is this concept related theoretically to other concepts?	Here are the main concepts to which this concept is theoretically related. 1. ____________ 2. ____________ 3. ____________ n. ____________	Project Director and associates.

Evaluation Decision #2

1. The evidence for the importance of the concept is substantial; move ahead.

2. Peripheral concept; reconsider evidence or return to start.

The significance of the concept is probably the most crucial issue in the development of protocol materials. A danger lies in working with private concepts, i.e., meaningful only to the director. If the concept appears in three textbooks in the field, it is not a private concept but possesses a degree of universality. The importance of the concept to teaching can be substantiated by citing three research studies or scholarly papers in which the concept was investigated. A further indication that the concept is not private is its theoretical relationship to other concepts. Since the concept is part of a theoretical framework, the director must be able to list the main concepts to which his concept is theoretically related. If there is substantial evidence that the concept is significant, Evaluation Decision #2 is reached, and the director moves on to Frame Three. If the concept is peripheral, the director either must reconsider the evidence or return to the start.

valuation ecision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 3: Learning Objectives	Exactly what learning outcomes am I seeking as consequence of using this protocol?		
	Is the outcome limited to "concept acquisition"?	Here are the specifications for testing concept acquisition: 1. Target population ____ 2. General test format ____ 3. Cross-validity materials ____ 4. Target level of performance ____ 5. Required performance context ____	Project Director and/or evaluator
	Is the outcome concept generalization and mastery? What is "Mastery" to mean?	Here are the specifications for testing concept mastery: (incorporate the above and elaborate on:) 1. Scope or diversity of cross-validity materials. What is the range of instances in which the concept is to be recognized? ____ 2. Context and type of performance required to yield confidence that mastery has occurred ____	
Evaluation Decision #3 1. I see exactly how to determine whether the learning outcomes I wanted have occurred. 2. I need help in getting my learning objectives clarified.			

Frame Three is concerned with learning objectives. The learning outcomes desired as a consequence of using the protocol must be specified. If the outcome is limited to concept acquisition, the director and/or evaluator list the specifications for testing it. The target population must be indicated. This population may include both pre- and in-service teachers of English or history; it may be pre-service teachers in an educational psychology program, or it may include in-service teachers of mathematics. A target population of "pre- or in-service teachers" without qualifiers is too broad. A test format should be prepared, which, in its format assures the presence of the cross-validity film or tape. materials and a practical method of obtaining student responses. This test can be used to assess the degree of concept acquisition. The target level of performance should be specified; the director's goal may be 100% identification of the concept or only 80%. The required performance context should also be specified; the films may be self-contained or they may be accompanied by printed materials.

If the outcome is to be concept generalization and mastery, the evidence for the questions for concept acquisition listed above must be provided. In addition mastery must be defined in terms of the scope of the project. The scope of the cross validity materials should give a wide range of instances in which the concept is to be recognized. If the test of concept mastery is to be a segment of film, plans for sufficient footage must be incorporated from the beginning of the project. The director must indicate the context and the type of performance required by the users to assure that concept mastery has occurred. At Evaluation Decision point three the developer may decide that he needs help in clarifying his learning objectives. If they have been achieved, the director proceeds to Frame Four which is concerned with the anticipated user.

luation Decision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 4: The anticipated user	Precisely what "user" group do I have in mind?	Here are three courses (or modules) to which my protocol materials will be significant. 1. ______ 2. ______ 3. ______	Project Director and associates.
	If the average course has 135 (3x45) class hrs. and 270 student study hours available, what proportion should be devoted to the concept in my protocol?	In checking with instructors, X hours were suggested for this concept. Or X/405 of their time, of which X_1 are class time and X_2 are student study hours.	Instructors or trainers
Evaluation Decsion #4 1. I can meet my learning objectives in this length of time; move ahead. 2. I will need an extremely efficient package; take loop. 3. I think I am in trouble; take loop.	Will designing package to incorporate principles of concept learning help?	To judge evidence see Hudgins' program loop.*	Project Director and producer; production experts
	Will careful selection of media and production techniques help?	Consult ~~and~~ a production expert	
Evaluation Decision #5 1. I can meet user requirements; move ahead to production. 2. I doubt that I can meet user requirements; return to start.			

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*Hudgins, Bryce B. "The Portrayal of Concepts; An Issue in the Development of Protocol Materials," Acquiring Teaching Competencies; Reports and Studies II, Nat'l. Center for the Development of Training Materials in Teacher Education. School of Education, Indiana University.

Generally, the director has a group of users, instructors of pre- or in-service courses, in mind. However, generalizing that the materials may be used by either prospective or practicing teachers or both is an insufficient basis for assuming that the materials will be useful. The director should list three specific courses (or modules if a modular program is used) in which his protocol materials will be significant. Since his materials probably will not constitute an entire course, he should determine the proportion of a course that will focus on the concept exemplified in the materials. His judgment of the time required can be verified by course instructors in determining what the learning outcomes are worth in terms of time. If the evidence indicates that the director consulting with the producers can accomplish his learning objectives in that specified period of time, he has completed Evaluation Decision #4 and moves on to Decision #5. However, if he cannot produce such evidence, he may have to redesign his package to better incorporate principles of concept learning. The director may also need to discuss with a production expert as well as the producer the possibilities of improved production techniques. If the director finds that he is unable to meet the user requirements, he returns to Frame One; if he meets them, he moves into the production phase.

Evaluation Decision Points	Criterial Questions	Evidence for Questions	Person Providing Evidence
Frame 5: Evaluation of Results	Have multiple equivalent forms of the main stimulus materials been prepared?	Here are: 1. An entry test, based stimulus materials, which can be used to place or "pass out" advanced students. 2. A test of concept acquisition composed of materials different from the learning materials (cross-validation or generalization materials) 3. A test of concept mastery composed of complex stimuli from which the concept indicators must be discriminated (if learning objectives require concept mastery).	Project Director, producer, evaluator
	Have exact instructions for users been prepared?	Here are: 1. A kit which tells the user how to use the protocol package. 2. Directions will tell the user how to administer the tests in the package in order to obtain reliable results	

Evaluation Decision #6

1. The materials for appraising results are ready; move ahead.
2. The production design failed to yield the appropriate materials. Consider additional production or re-editing.

Evaluation Decision Points	Criterial Questions	Evidence for Questions	Person Providing Evidence
Frame 5 cont.	Has sample of users been identified n > 1	Here is the list of users for the field trial. 1. ____________ 2. ____________ 3. ____________	Project Director, evaluator
	Are the students of the users in the target population specified under learning objectives?	Here are the major characteristics of the students ______________	Evaluator
	Does the user have approximately the required performance context?	Here is a description of the performance context ______________	Evaluator
Evaluation Decision #7 1. The user and context are congruent with learning objectives; move ahead. 2. The field situation is bad and should be dropped; a new set of users must be found.			
	Can the students of each user be divided into a treatment group (or groups) and controls.	Here is the method by which treatment and control subjects were assigned.	Evaluator
Evaluation Decision #8 1. Treatment and control subjects were randomly assigned; move ahead. 2. Assignment is bad; intact groups or single group design must be used; move ahead or get new user group.			

Evaluation Decision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 5 cont.	Did the user follow the direstions exactly?	Here is a list of departures from set procedures _____	Evaluator
	What were the results?	Here are the results: 1. User satisfaction. 2. Student satisfaction. 3. Proportion of students who had already acquired concept. 4. Time to criterion for treated students. 5. Differences between criterion performances: treatment vs. controls.	
Evaluation Decision #9 1. The package attains the objectives and seems efficient. 2. The package was partly successful: 1, 2, 3... 3. The package should be shelved, where did we go wrong?			

Frame five is concerned with the evaluation of the results of using the protocol materials. The first criterial question deals with the director's preparation of multiple equivalent forms of the main stimulus materials. Three types of tests should be available. The first is an entry test based on the stimulus materials which can be used to place students in terms of their knowledge of the concept; if, at this stage, some students exhibit mastery of the concept, they need proceed no further. The second is a test of concept acquisition composed of material different from the learning materials. If the learning objectives require concept mastery, the third test, which is composed of complex stimuli from which the concept indicators must be discriminated, is used. Turner considers the difference between concept acquisition and concept mastery as one of degree.

Exact instructions for users of the protocol materials must be prepared so that the protocol materials package will be used properly. A 'kit" or manual telling the user how to use the protocols package must include directions for administering the tests in order to obtain reliable results. If the production design does not yield the appropriate materials, the director may decide to re-edit or to produce more material. When the materials for evaluating results of the protocols are completed, Evaluation Decision #6, the director moves on.

The next criterial question concerns identification of a sample of users for the field test; the sample must include more than the director's class. The director and evaluator should provide a list of at least three potential users for the field trial. Evidence for the next two criterial questions is provided by the evaluator. Students of the users in the target population should be specified under the learning objectives; the major characteristics of the students should be listed. To provide evidence for the criterial question, has the user an appropriate required performance context, the evaluator describes this context.

This step brings the director to Evaluation Decision #7; if the field situation is not appropriate, another group of users must be found for the field trial. If both the users and context are congruent with the learning objectives, the director moves on to the next evaluation decision point where the evidence again is supplied by the evaluator. He determines if the students of each user can be divided into a treatment group (groups) and a control group and determines the method by which the treatment and control subjects were assigned. Evaluation Decision #8 is now reached, and if the treatment and control subjects were randomly assigned, the director moves ahead. If the assignment was not random, the evaluator must decide whether or not to employ a weaker design such as the intact groups, or a single group design with no controls. The group or groups are tested either for concept acquisition or concept mastery depending upon the learning objectives. An entry test must be provided if the single group design is used. If the evaluator prefers to use a randomized, experimental-control design, he must find a new user group before moving ahead. Once the user group is selected, the evaluator must determine if the user followed the directions precisely; any departures from the established procedures must be noted.

The last criterial question concerns the results of using the protocol materials. These include the user's satisfaction with the materials as well as the students', the proportion of students who had acquired the concept prior to the use of the protocol materials as determined by results of the entry test, the actual time spent by the students vefore they reached the criterion level, and the differences between the criterion performance of the treatment and control groups.

If the protocol materials package attains the objectives and seems efficient at Evaluation Decision #9, the materials are ready for summative evaluation. If the package was only partly successful, the director should be able, if he has satisfactorily accomplished each evaluation decision point, to ameliorate the situation.

Although each projector director field tests his protocol materials as he develops them, the National Center for the Improvement of Educational Systems also has a grant with the Florida State Department of Education for field testing on a systematic basis all the materials developed in the protocol materials projects. The overall plan for field testing the materials provides data on the materials, collected at both the pre- and in-service levels.

As the materials under development are completed, the Florida State Department project staff will list and describe each concept exemplified in the protocol materials produced by each project and discuss the development process used for each of the materials. After the field testing has been completed, a review board will examine the data from the field test and determine, on the basis of specified criteria, which of the protocol materials products are ready for widespread dissemination.

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Appendix A

Pilot Protocol Materials Projects, Funded FY 1971

1. California State University, Northridge--Protocol Materials in English
2. Stanford University-Far West Regional Laboratory--Protocol Materials in Teacher and Student Behavior, Teacher-Student Interaction in the Classroom.
3. University of Colorado--Protocol Materials in Instruction as an Interactive Process
4. Florida State Department of Education--Field Testing of Materials Produced in Protocol Materials Projects
5. Indiana University--Protocol Materials in Cognitive and Affective Interaction and Classroom Management
6. Harvard University--Educational Development Corporation Protocol Materials Relationship Between Learning Behavior and Conceptual Demands of Subject
7. Washington University--Protocol Materials in Teaching Concepts Teaching Interpreting, and Teaching Particulars
8. Michigan State University--Protocol Materials in Classroom Interaction (Model Learning, Respondent Learning, Reinforcement, Operant Learning, Shaping)
9. Ohio State University--Protocol Materials in Oral Language Acquisition
10. Teaching Research, Oregon State System of Higher Education, Protocol Materials in Learner Outcomes
11. Bucknell University--Protocol Materials in Reading

Appendix B

PROGRESSIVE EVALUATION OF PROTOCOL MATERIALS DEVELOPMENT

Richard L. Turner
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National Center for the Development of
Training Materials in Teacher Education

and

Leadership Training Institute for
Protocol and Training Materials

PROGRESSIVE EVALUATION OF

PROTOCOL DEVELOPMENT

Evaluation Decision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 1: **The Concept**	Start		
	What is the label (name) for the concept?	The label is ______	Project Director
	What are the criteria-in-mind- for the concept? How would I know when to apply this concept in a situation?	The criteria-in-mind are: (tell or show) 1.______ 2.______ 3.______ n.______	Project Director
	Can I sketch three situations in which the concept would be observed in (or induced from) someone's behavior?	The sketches are (1 paragraph each) 1.______ 2.______ 3.______	Project Director gives three. Producer gives different three.
Evaluation Decision #1 1. The concept probably can be represented; move ahead. 2. Concept not clear: reconsider evidence or return to start.			

FOREWORD

"Progressive Evaluation of Protocol Materials Development" was originally prepared for use by protocol materials developers in a workshop at Michigan State University in October, 1971. The term "progressive evaluation" is used to describe the step-wise or progressive nature of evaluation which occurs when development moves through successive phases. "Protocol materials" are instructional materials, usually employing audio tape, video tape or film, intended to illuminate a concept by showing instances to which the concept correctly applies. These instances typically involve the behaviors of children and adults as they appear in the classroom or in other community settings in which teachers might be expected to interpret behavior for purposes of education.

Because the workshop was intended to promote the critical examination and discussion of protocol development in small groups, the document presented here appeared as a linear program of questions which required the production of some form of evidence in response, thus facilitating group discussion. On subsequent pages, the linear format is maintained, but since the reader cannot discuss or critique the various points with the writer, notes are provided to illuminate those questions and requests for evidence which may not immediately be clear. To facilitate reading, each frame of the program appears on the left-hand page, and the notes pertinent to that frame appear on the page opposite. To perform the program realistically, the reader should get a concept significant to teaching in mind, begin at <u>Start</u>, then respond to each question with the appropriate type of evidence.

Notes for Frame 1

The criteria-in-mind for a concept are those characteristics of things or processes which enable one to reliably identify them as belonging to a particular class. When the concept is considered "closed", the necessary and sufficient characteristics for a thing to be placed in the class are known. Thus, the necessary and sufficient characteristics of "reinforcement" are: 1) that it follows a response, and 2) that it increases the probability of the response it follows. An "open" concept is one for which the salient characteristics may be identified, but the necessary and sufficient characteristics to exhaustively define the meaning of it cannot be stated. Concepts labeled by such terms as "creativity", "ego", "anxiety", "democracy", may be viewed as open. Although the criteria-in-mind for closed concepts can usually be more easily stated than for open concepts, in both instances it it is very important for the protocol developer to be able to sketch instances to which the concept correctly applies. When many instances

Evaluation Decision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 2: The significance of the concept	How important is this concept? Can I name three texts in which the concept appears?	The texts and page references are: 1. ______ ______ 2. ______ ______ 3. ______ ______	Project Director and associates
	What empirical evidence is there to support the importance of the concept to teaching?	The following scholarly papers investigated the concept: 1. ____________ 2. ____________ 3. ____________	Project Director and associates
	Is this concept related theoretically to other concepts?	Here are the main concepts to which this concept is theoretically related. 1. ____________ 2. ____________ 3. ____________ n. ____________	Project Director and associates.

Evaluation Decision #2
1. The evidence for the importance of the concept is substantial; move ahead.

2. Peripheral concept; reconsider evidence or return to start.

Notes for Frame 2

In the social sciences many significant concepts cluster together within a theoretical system. Thus in Freudian psychology, anxiety and the attendant defense mechanisms are to be understood relative to other concepts such as id, superego and ego. In Skinnerian psychology, reinforcement, shapint, and extinction belong to a cluster, while Rogerian theory, self, threat, and anxiety cluster together. In social psychology task role, social role and leadership style cluster and must be carefully distinguished from each other. If the protocol developer is careful to observe such clusters, families of protocol materials may be developed.

A difficulty with many concepts in the social sciences is that they are wholly inferential entities or "constructs". A construct is not directly observable and cannot be instanced, although "indicators" of the construct may be instanced. Thus, ego processes cannot be directly instanced, but ego defense mechanisms, which are taken to be indicators of the presence of ego processes in Freudian theory, can be instanced.

Many social science concepts are of theoretical importance within a particular discipline, but may be of limited utility to a teacher in interpreting behavior and in subsequently taking some action with respect to that behavior. Thinking of situations in which a teacher might employ the concept one has in mind for a protocol provides a test of its practicality for teachers and helps one judge whether or not the concept is truly a significant one.

luation cision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 3: Learning Objectives	Exactly what learning outcomes am I seeking as consequence of using this protocol?		
	Is the outcome limited to "concept acquisition"?	Here are the specifications for testing concept acquisition: 1. Target population ________ 2. General test format ________ 3. Cross-validity materials ________ 4. Target level of performance ________ 5. Required performance context ________	Project Director and/or evaluator
	Is the outcome concept generalization and mastery? What is "Mastery" to mean?	Here are the specifications for testing concept mastery: (incorporate the above and elaborate on:) 1. Scope or diversity of cross-validity materials. What is the range of instances in which the concept is to be recognized? ________ 2. Context and type of performance required to yield confidence that mastery has occurred ________	
Evaluation Decision #3 1. I see exactly how to determine whether the learning outcomes I wanted have occurred. 2. I need help in getting my learning objectives clarified.			

Notes for Frame 3

The difference between "concept acquisition" and "concept mastery" is viewed as one of degree. Concept acquisition implies that the learner can verbalize the characteristics which define the concept and/or recognize instances of the concept under controlled conditions and when a narrow range of possible instances are presented to him. Under these conditions, one may say that the learner has "acquired" the concept. Concept mastery implies that the learner can invariably recognize instances of the concept under a variety of simulated and real-life situations without special supporting cues or prompts.

In most instances protocol developers cannot provide appropriate conditions for completely testing concept mastery. What they can provide are cross-validity materials drawn from the total film or tape footage used to produce the protocol training materials. If one shoots two hours of film to develop a ten minute protocol on "probing" he should have, remaining in the footage, a large number of instances of probing as well as numerous instances of questions which might seem like probing but are actually negative instances. Editing these positive and negative instances into test films accompanied by appropriate instructions and response forms provides a means by which to evaluate the degree to which the learner has progressed toward mastery.

luation Decision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 4: The anticipated user	Precisely what "user" group do I have in mind?	Here are three courses (or modules) to which my protocol materials will be significant. 1. ____________ 2. ____________ 3. ____________	Project Director and associates.
	If the average course has 135 (3x45) class hrs. and 270 student study hours available, what proportion should be devoted to the concept in my protocol?	In checking with instructors, X hours were suggested for this concept. Or X/405 of their time, of which X_1 are class time and X_2 are student study hours.	Instructors or trainers
Evaluation Decision #4 1. I can meet my learning objectives in this length of time; move ahead. 2. I will need an extremely efficient package; take loop. 3. I think I am in trouble; take loop.	Will designing package to incorporate principles of concept learning help?	To judge evidence see Hudgins' program loop.*	Project Director and producer; production experts
	Will careful selection of media and production techniques help?	Consult and production expert	
Evaluation Decision #5 1. I can meet user requirements; move ahead to production. 2. I doubt that I can meet user requirements; return to start.			

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*Hudgins, Bryce B. "The Portrayal of Concepts; An Issue in the Development of Protocol Materials," Acquiring Teaching Competencies: Reports and Studies II, Nat'l. Center for the Development of Training Materials in Teacher Education. School of Education, Indiana University.

Notes for Frame 4

A critical consideration in the design of protocol materials lies in their adaptability to different user needs. Some instructors may wish to use them in large groups, some in small, and others in individual study carrels or by television. Some instructors will consider the concept highly significant in his or her instruction, others will consider the concept minor and wish to devote little time to it. Although each developer must develop his own strategy for meeting diverse user needs, a good strategy is to assume that the materials will be subjected to the most stringent demands--those in which the student is required to acquire or master the concept by individual study of self-administered materials. This strategy is a good one because it permits the instructor to retreat toward less structured approaches such as small group discussion if he wishes to do so. The opposite approach, providing little structure for the use of the materials, places the instructur in the position of having to develop his own materials if he wishes the student to acquire the concept by self instruction, and, by increasing the time investment of the instructor, decreases the probability of use.

For self-instructional use, massive quantities of written material are rarely functional. "Self-administered" may mean only that the student has contact with introductory material, can view or listen to the protocol, and can test himself on the testing films or apes until adequate proficiency is achieved.

Evaluation Decision Points	Criterial Questions	Evidence for Questions	Person Providing Evidence
Frame 5: Evaluation of Results	Have multiple equivalent forms of the main stimulus materials been prepared?	Here are: 1. An entry test, based stimulus materials, which can be used to place or "pass out" advanced students. 2. A test of concept acquisition composed of materials different from the learning materials (cross-validation or generalization materials) 3. A test of concept mastery composed of complex stimuli from which the concept indicators must be discriminated (if learning objectives require concept mastery).	Project Director, producer, evaluator
	Have exact instructions for users been prepared?	Here are: 1. A kit which tells the user how to use the protocol package. 2. Directions will tell the user how to administer the tests in the package in order to obtain reliable results	
Evaluation Decision #6 1. The materials for appraising results are ready; move ahead. 2. The production design failed to yield the appropriate materials. Consider additional production or re-editing.			

Notes on Frame 5

The point of evaluation is to influence confidence in the value of some thing or process. Generally, confidence in value is increased as the number of empirical tests for value increases. Several types of empirical tests may be recognized with respect to protocol materials.

1. If the instructors and students report that the materials were satisfying and worthwhile, given the needs they wished to meet by using them, increased confidence in value occurs.

2. If students moved from a low level of mastery of the concept (say 20%) prior to using the materials to a high level of mastery (say 80%) following their use, confidence in value is increased, even though no comparative data (e.g., from a control group) are available. If most of the students had 80% mastery to begin with, confidence in the value of the materials is <u>decreased</u>, since they teach a concept students already know and are therefore redundant.

3. If randomly assigned students who are instructed by means of the materials significantly out-perform a randomly assigned control instructed by other methods for equal time, confidence is increased.

Evaluation Decision Points	Criterial Questions	Evidence for Questions	Persons Providing Evidence
Frame 5 cont.	Did the user follow the direstions exactly?	Here is a list of departures from set procedures ____	Evaluator
	What were the results?	Here are the results: 1. User satisfaction. 2. Student satisfaction. 3. Proportion of students who had already acquired concept. 4. Time to criterion for treated students. 5. Differences between criterion performances: treatment vs. controls.	
Evaluation Decision #9 1. The package attains the objectives and seems efficient. 2. The package was partly successful: 1, 2, 3... 3. The package should be shelved, where did we go wrong?			

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Evaluation Decision Points	Criterial Questions	Evidence for Questions	Person Providing Evidence
Frame 5 cont.	Has sample of users been identified $n > 1$	Here is the list of users for the field trial. 1. ________ 2. ________ 3. ________	Project Director, evaluator
	Are the students of the users in the target population specified under learning objectives?	Here are the major characteristics of the students ________	Evaluator
	Does the user have approximately the required performance context?	Here is a description of the performance context ________	Evaluator
Evaluation Decision #7 1. The user and context are congruent with learning objectives; move ahead. 2. The field situation is bad and should be dropped; a new set of users must be found.			
	Can the students of each user be divided into a treatment group (or groups) and controls.	Here is the method by which treatment and control subjects were assigned.	Evaluator
Evaluation Decision #8 1. Treatment and control subjects were randomly assigned; move ahead. 2. Assignment is bad; intact groups or single group design must be used; move ahead or get new user group.			

Moreover, as the number of alternative methods of instruction to which the protocols are superior increases, confidence in the value of the protocols correspondingly increases. If the protocol materials are superior to other methods for teaching the same concept(s), but require greater instructional time, confidence in value is not increased.

4. As the number of different users who report satisfaction, increases in mastery, and comparative superiority for protocol materials increases, confidence in their value correspondingly increases.

A major point of failure in many evaluation efforts lies in inadequate procedures or in the inadequate <u>reporting</u> of procedures; equal care in the evaluation procedures will help insure a product in which full confidence can be invested.